Indicators of Green Consumption

- Green GNP was developed by the World Bank for the purpose of subtracting the costs associated with natural resource depletion and pollution damage (World Bank 1999, p. 104).

- Genuine saving is also a macroeconomic measure of development. It measures the rate at which wealth is being created or destroyed—the true saving rate after accounting for investments in human capital, depreciation of produced assets, and depletion and degradation of the environment. Negative genuine saving implies that total wealth is in decline. Genuine saving departs from standard national accounting in several ways. It deducts from output values the value of natural resources used in producing that output. Reducing pollution damage—including lost welfare in human sickness and death—is also appropriate if society aims to maximize welfare. Furthermore, genuine saving considers current education spending as an increase in saving, not in consumption as in traditional accounts (World Bank 1997).

- Office of Quality-of-Life Measurement
### Indicators of Paper Consumption

In many Western countries, high paper consumption has come to be regarded as a symbol of overconsumption and wastefulness. In the developing world, paper consumption is growing quite rapidly—by more than 7 percent annually between 1990 and 1994—though varies per capita consumption remains low, at about 15 kilograms per capita per year. It is estimated that 30 billion tons of paper are used per year; it is needed to meet basic needs for communication and literacy. In the industrialized countries, consumption is vastly greater—125 kilograms per capita per year in the United States and 120 in Western Europe (Robins et al. 1997, p. 32). Globally, paper consumption has increased by a factor of 20 this century and has tripled over the past several decades (Robins et al. 1997, p. 32). Paper consumption is projected to grow by about 50 percent by 2010. The biggest increases—over 50 percent—are expected to be in Asia. The current rate of 2.5 billion trees per year is expected to exceed the rate of overconsumption and wastefulness of modern society (WRI 1998, pp. 163-165).

### Indicators of Automobile Consumption

In 1990, there were only 70 million cars, trucks, and buses on the world's roads. By 1994, there were over 120 million, a 70 percent increase. Since about 1970, the global fleet has been growing at the rate of about 10 million vehicles per year. This expansion has been accompanied by a steady linear growth in fuel consumption. It is projected that by the year 2025, there will be over 1 billion vehicles on the world's roads. Per capita car ownership is high in the wealthy nations of North America, Western Europe, and Japan. Growth potential is great in the rapidly developing economies of Asia. In China, for example, there are only 8 vehicles per 1,000 persons, and in India, only 7 per 1,000 persons. In contrast, there are about 750 vehicles per 1,000 in the United States (WRI 1998, pp. 171-173, 278-279; AAMA 1993, p. 23; 1996, p. 44).

### Indicators of Coffee Consumption

Coffee production has grown 200 percent since 1950, and recent years have seen a range in consumer demand of specialty coffees (ICO 1997). Modern coffee production has caused much environmental damage (Bunce and Ward 1996, p. 12). Organic coffee sales (coffee produced with minimal environmental damage) are currently growing faster than any other type of specialty coffee, though still represent only 1 to 2 percent of the $5 billion specialty coffee market. Organic coffee beans sell for 10 to 15 percent more than the standard gourmet beans (Bunce and Ward 1996, pp. 22-24).

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### Indicators of Natural Resources

A detailed study (Adriaanse et al. 1997) of Germany, Japan, the Netherlands, and the United States shows that for highly industrialized economies, the true value of natural resources required is in the range of 45 to 85 metric tons of material per US$100 income, over the next several decades (Adriaanse et al. 1997).

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Indicators of Motor Gasoline Consumption

The Statistics Division of the United Nations Department for Economic and Social Information and Policy Analysis gathers statistics on consumption of motor gasoline worldwide. It is the amount of motor gasoline consumed per country reported in thousand metric tons, converted to million liters (1 metric ton = 1,351 liters). Based on the 1998-99 figures (WRI 1998, pp. 266-267), the United States is the highest consumer of motor gasoline, standing at 451,853 million liters in 1995.


Indicators of Resource Efficiency

Overall, resource efficiency has improved by about 2 percent per year in industrialized countries since 1970 (Glyn 1995, p. 49).


Indicators of Energy Consumption

In the developed world, energy use per capita is already extremely high and continues to increase daily. By contrast, the most rapid growth is now occurring in the developing countries, where energy use is still relatively low compared with that in more affluent nations. Developing nations account for more than 80 percent of world population, but consume only about one third of the world's energy. That will likely to change quickly. The developing nations' share of commercial energy consumption is expected to grow to nearly 40 percent by 2010 (WRI 1998, pp. 170-171, 332-333; IEA 1996, pp. 18-19, 1997, p. 73).


Indicators of Private Consumption

Private consumption is a measure used by the United Nations Development Programme to compare consumption patterns among countries. It is the market value of all goods and services, including durable products (such as cars, washing machines, and home computers), purchased or received as income in kind by households and non-profit institutions (UNDP 1998, p. 218).

In industrialized countries, concerns have focused on the ever-increasing volumes of waste paper being created. Disposal of paper products in landfill sites leads to emissions of the greenhouse gas methane. Furthermore, the incineration of chlorine-bleached paper causes the release of dioxins into the atmosphere (WRI 1998, p. 164).


The U.S. paper industry has set a voluntary goal of a 50 percent recovery rate by 2000. In 1996, the national recovery rate was 44.8 percent (American Forest and Paper Association 1997).

Another measure of disposal used by the United Nations Development Programme is waste recycling (as percent of apparent consumption), divided into paper and cardboard recycling and glass recycling (UNDP 1998, p. 203). For example, using 1992-95 figures, the Netherlands has achieved 77 percent paper/cardboard recycling and 80 percent recycling of glass. The United States, in contrast, has achieved 35 and 23 percent, respectively.

**Problems with Current Indicators**

- Fragmented
- Incomplete
- Not guided by a theoretical concept of sustainable consumption
- Untested for psychometric validity
- Not test sensitive (to intervention programs)

**Sustainable Consumption: A Definition**

Sustainable consumption from a consumer life cycle perspective refers to consumers purchasing more environmental-friendly goods and packaging, consuming less energy goods, maintaining and repairing more durable goods to extend product longevity, and disposing of goods in a more environmentally-friendly manner.
Sustainable consumption from a consumer life cycle perspective refers to four behavior dimensions:

1. **Consumers purchasing**
   - Less of unrecycled goods (e.g., gasoline motored cars) and more of recycled substitutes (e.g., battery-motored cars).
   - Less of environmentally unfriendly goods (e.g., paper communications) and more of environmentally friendly substitutes (e.g., electronic communications).
   - Less of goods with environmentally unfriendly packaging (e.g., orange juice in plastic bottles) and more goods with environmentally friendly packaging (e.g., refillable containers).
   - Less of goods that consume much energy (e.g., gas guzzler cars) and more goods that consume less energy (e.g., economy cars).

2. **Consumers consuming**
   - Less energy goods (e.g., using less heat in the winter months and less air conditioning in the summer months).

3. **Consumers enhancing**
   - The longevity of their material possessions by maintaining and repairing them instead of disposing and purchasing new ones (e.g., repairing one’s car instead of trading it in for a new one).

4. **Consumers disposing**
   - Their material possessions in environmentally friendly ways (e.g., recycling most of their throwaways).
Proposed Purchase Measures Based on Consumer Surveys

1a. Unrecycled durable goods are non-grocery products that cannot be reused. They are totally consumed once you use them. Recycled durable goods on the other hand are non-grocery items designed to be reused over and over again. An example of recycled durable good is a battery-powered automobile. You recharge the battery every so often. An unrecycled durable good, in contrast, is a gasoline-powered automobile. You use the fuel only once and it is used-up. Think about all the durable goods you have bought during the past year or so. In the last six months or so, have you bought any durable product listed below. If so, indicate what those items are and tell us whether those items are recyclable to the best of your knowledge.

<table>
<thead>
<tr>
<th>Specify item (s)</th>
<th>Recyclable</th>
<th>Non-recyclable</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>laundry supplies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>kitchen supplies</td>
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<td></td>
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<tr>
<td>baby supplies</td>
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<tr>
<td>garden supplies</td>
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<tr>
<td>automotive supplies</td>
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<td></td>
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<tr>
<td>office supplies</td>
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</table>

1b. Environmentally friendly goods are products that are manufactured in ways that do not damage the environment or deplete precious environmental resources. For example, the way organic coffee beans are grown and harvested degraded the environment. People use electronic communications (e-mail) instead of paper communications. Doing so helps preserve forests. Other products are environmentally friendly in the way they become disposed. For example, biodegradable diapers do not tax the environment the way plastic diapers do. Below is a list of environmentally friendly products. We would like to know whether you have bought and used any of these products during the past year or so.

In the last six months or so, have you bought and used products that are friendly to the environment? (Respond by checking all the environmentally friendly products you have bought during the past year or so.)

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>certified organic coffee</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>organic-grown fruits/vegetables</td>
<td></td>
<td></td>
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<tr>
<td>biodegradable diaper</td>
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<td></td>
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<tr>
<td>brown paper-grocery bags</td>
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<td></td>
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<tr>
<td>hybrid/electric car</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>solar lights</td>
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</tbody>
</table>
1c. Environmentally friendly packaging is packaging material that does not damage the environment when the product is consumed. For example, the use of Styrofoam in packaging hamburger sandwiches damages the environment. This is because Styrofoam is not a biodegradable packaging material. On the other hand, packaging made out of paper is more environmentally friendly. Furthermore, packaging can be friendly or unfriendly to the environment in the way the packaging material is manufactured. For example, bleached cardboard is not friendly to the environment because the use of bleach in making it adversely affects the water supply. Below is a list of environmentally friendly packaging. We would like to know whether you have repeatedly used packaging material that is environmentally friendly in the past year or so.

Have you repeatedly used environmentally friendly packaging material? (Respond by circling all the environmentally friendly packaging you have used during the last six months or so.)

- paper bags at the grocery store
- brown cardboard boxes
- refillable containers
- reusable canvas grocery bags
- air bags as packing stuffers
- brown paper packaging stuffers

1d. Certain durable goods when consumed use much energy. For example, certain pick-up trucks, sport utility vehicle, and vans are gas guzzling cars. In contrast, the small, economy cars are quite efficient in using less fuel. Below is a list of products that most families have in their household. We would like to know whether in the last six months or so you have bought an energy-saving good.

Have you recently bought energy-saving goods? (Respond by checking all the energy-saving goods listed below that you have bought during the last six months or so.)

- low energy refrigerator
- low energy air conditioner/heat pump
- electric blanket
- solar panels
- high insulation doors/storm windows/doors
- fluorescent lights
- natural landscaping devices
- wall insulating materials
- high insulation windows
Proposed Consumption Measures
Based on Consumer Surveys

2. Some consumers using more energy than usual while others are conserving energy. How do you rate yourself in relation to your recent use of energy such as electricity, water, gas, etc.? We would like to know whether in the last six months or so you have made changes in relation to the following energy consumption habits:

<table>
<thead>
<tr>
<th>Did significantly less during the last year or so</th>
<th>Did significantly more during the last year or so</th>
<th>About the same</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used electric power to heat home</td>
<td>-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5</td>
<td></td>
</tr>
<tr>
<td>Used gasoline in driving</td>
<td>-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5</td>
<td></td>
</tr>
<tr>
<td>Used water for bathing</td>
<td>-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5</td>
<td></td>
</tr>
<tr>
<td>Used gas for cooking</td>
<td>-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5</td>
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</table>

Proposed Maintenance Measures
Based on Consumer Surveys

3. Some consumers make an effort to enhance the longevity of their durable possessions by maintaining and repairing them instead of disposing and purchasing new ones. For example, some would attempt to repair gadgets such as telephone, TV, and toaster, instead of buying new ones. Think about all the durable goods you have repaired or fixed during the past year or so.

Have you repaired any durable good during the six months year or so? (Respond by checking the applicable product categories you have repaired or serviced.)

- Dishwasher
- Home furniture
- Office furniture
- Washing machine
- Lawn mower
- Car
- Boat
- CD player
- Radio
- Television
- Stereo system
- VCR
- Camera or camcorder
- Computer/Accessories
- Telephone/Accessories
- Refrigerator
- Home heating equipment
- Home cooling equipment
- Stove/oven
- Clothes/accessories
- Drying machine
- Vacuum cleaner
- Microwave oven
4. Some consumers recycle their trash while others dispose it the old-fashioned way. How do you rate yourself in relation to your recent recycling efforts? We would like to know whether in the last six months or so you done more or less recycling of the items listed below (don’t respond to products you don’t use).

Use the following scale:

-2 = Recycled significantly less during the last six months
-1 = Recycled somewhat less during the last six months
0  = Recycled about the same during the last six months
+1 = Recycled somewhat more during the last six months
+2 = Recycled significantly more during the last six months

- Paper and paper products  -2    -1     0     +1    +2
- Plastic bottles and containers -2    -1     0     +1    +2
- Tin can and containers -2    -1     0     +1    +2
- Aluminum cans and containers -2    -1     0     +1    +2
- Household cleaners -2    -1     0     +1    +2
- Paint products -2    -1     0     +1    +2
- Automotive parts -2    -1     0     +1    +2
- Pharmaceuticals -2    -1     0     +1    +2
- Household batteries -2    -1     0     +1    +2